



INVESTMENT MANAGEMENT COMMITTEE



April 2016

**TEACHER RETIREMENT SYSTEM OF TEXAS MEETING
BOARD OF TRUSTEES
AND
INVESTMENT MANAGEMENT COMMITTEE**

(Committee Chair and Members are Subject to Change at the April Board Meeting. Mr. Colonna, Committee Chair; Mr. Barth; Mr. Corpus; Mr. Kelly; & Ms. Sissney, Committee Members)

AGENDA

**April 7, 2016 – 11:45 a.m.
TRS East Building, 5th Floor, Boardroom**

*All or part of the April 7, 2016 meeting of the TRS Board of Trustees and Investment Management Committee may be held by telephone conference call as authorized under Section 551.130 of Texas Government Code. The committee and board intend to have a quorum physically present at the following location: **1000 Red River Austin, Texas 78701 in the TRS East Building, 5th Floor, Boardroom.***

1. Consider the approval of the proposed minutes of the November 19, 2015 committee meeting – Joe Colonna.
2. Receive and discuss the annual Internal Public Markets review – Chi Chai, Patrick Cosgrove, and KJ Van Ackeren.
3. Receive and discuss the annual Trading Management Group review – Bernie Bozzelli, Jaime Llano, and Steve Peterson.

NOTE: The Board of Trustees (Board) of the Teacher Retirement System of Texas will not consider or act upon any item before the Investment Management Committee (Committee) at this meeting of the Committee. This meeting is not a regular meeting of the Board. However, because the full Investment Management Committee constitutes a quorum of the Board, the meeting of the Committee is also being posted as a meeting of the Board out of an abundance of caution.

Minutes of the Investment Management Committee

November 19, 2015

The Investment Management Committee of the Board of Trustees of the Teacher Retirement System of Texas met on November 19, 2015 in the boardroom located on the fifth floor of the TRS East Building offices located at 1000 Red River Street, Austin, Texas. The following committee members were present:

Joe Colonna, Chair
Todd Barth, Presiding Chair
David Corpus
David Kelly
Nanette Sissney

Others present:

Christopher Moss, TRS Trustee
Anita Palmer, TRS Trustee
Karen Charleston, TRS Trustee
Dolores Ramirez, TRS Trustee
Brian Guthrie, TRS
Ken Welch, TRS
Jerry Albright, TRS
Carolina de Onís, TRS
Britt Harris, TRS
Amy Barrett, TRS
Jase Auby, TRS
James Nield, TRS
Mark Albert, TRS
Solomon Gold, TRS

Patrick Zerda, TRS
Eric Lang, TRS
Lynn Lau, TRS
Katy Hoffman, TRS
Dr. Mark Talbert, TRS
Heather Traeger, TRS
Dr. Mohan Balachandran, TRS
Steve Huff, , Fiduciary Counsel, Reinhart Boerner Van Deuren s.c.
Dr. Keith Brown, Investment Advisor
Mike Comstock, Aon Hewitt
Steve Voss, Aon Hewitt
Philip Mullins, Texas Retired Teachers Association
Ann Fickel, Texas Classroom Teachers Association
Ted Melina Raab, Texas American Federation of Teachers

Mr. Barth called the meeting to order at 1:10 p.m. A quorum was present.

1. Consider the approval of the proposed minutes of the September 24, 2015 committee meeting – Committee Chair.

On a motion by Mr. Colonna, seconded by Mr. Corpus, the committee unanimously voted to approve the proposed minutes of the September 24, 2015 meeting, as presented.

2. Review Risk Management and Strategies – Jase Auby.

Mr. Auby provided an overview of the Risk Group, including its organizational structure, 2015 priorities and accomplishments, functions, key risk signals, and 2016 preliminary priorities. He reported that the Risk Group executed its mandate to enable efficient risk-taking through managing and monitoring risk. He said that the group experienced a drawdown in the third quarter of 2015, as did other trust portfolios, and ended with 178 basis points of alpha for the year and 183 basis points of alpha since inception. He noted that the group completed five priority projects for the year. Responding to a question from Dr. Brown regarding balancing the roles of managing assets and monitoring risk, Mr. Auby stated that Mr. Harris always wanted the group to both monitor and manage investment risk. He noted that the group created the Risk Parity Portfolio as an alternative form of strategic asset allocation so as to rely less on equity risk premia. He stated that risk parity



is intended to be diversifying for the trust by creating defensive alpha, doing well in down-markets and less well in up-markets.

Mr. Nield described the bubble signals generated in 2015 and the process of using the signals to make recommendations based on valuations. He also compared the bubble signals generated in 2007, 2009, 2011, and 2015 for 11 major asset classes and their correlated market conditions.

Mr. Auby discussed key risk signals that show the U.S. and global macro environment as expressed through inflation growth. He also provided an update on the CUSUM signals process, a tool that identifies patterns of persistent underperformance within portfolios. He introduced a new risk signal that indicates the risk of a bear market, which often coincides with recession.

Mr. Auby reviewed the 2015 priorities that had been accomplished, including (1) increased allocations to the Risk Parity Portfolio; (2) the development and implementation of the Low Volatility with Overlay Portfolio; (3) the initiation of a new dynamic currency hedging portfolio; (4) a review of the Energy and Natural Resources risk model; and (5) the automation of daily monitoring processes for risk signals.

Mr. Nield provided an update on the Risk Parity Portfolio. He stated that it represented roughly 2.7 percent of trust assets and noted that the goal was to reach 5 percent of trust assets by the end of 2016. He reported that the portfolio had declined 6.6 percent in the past year, largely due to a 20 percent allocation to significantly declining commodities and a sizeable allocation to inflation-linked bonds which were slightly negative for the year. In response to a question from Mr. Barth, Mr. Nield confirmed that the internal portion of the portfolio substantially outperformed the external portion over the past year. Mr. Auby stated that the internal outperformance was mainly attributable to the slight underweight in commodities.

Mr. Nield explained for Mr. Barth that the Risk Parity Portfolio was constructed to have less exposure to commodities as part of a long-term strategic decision. He also said that the underweight in commodities was being made up by taking on more inflation exposure through the TIPS market or the inflation-linked market. Mr. Nield further stated that the inflation-linked market was flat or down 1 percent for the year versus the commodities market, which was down 26 percent. Responding to a question from Mr. Barth regarding how the portfolio was constructed, Mr. Nield stated that the trust used the Bridgewater allocation approach of balancing risk to inflation and growth and the AQR approach of measuring volatility to size up and down the portfolio. He noted that the portfolio's outperformance was due to relationships with managers and the knowledge and experience acquired from them.

Comparing the performance of Risk Parity with an alternative asset allocation portfolio of 60 percent stock and 40 percent bonds, Mr. Nield stated that Risk Parity was expected to outperform the 60/40 portfolio in 58 percent of the rolling one-year periods and 62 percent of the rolling three-year periods. However, he noted that Risk Parity had underperformed the 60/40 portfolio about 38 percent of the time. He stated that the relative performance of a risk parity portfolio to a 60/40 portfolio on average was about 2.6 percent. Mr. Auby noted that the current period of underperformance was correlated with a time period when a relatively low amount of dollars was allocated to the Risk Parity strategy. He projected that Risk Parity would be well positioned to experience outperformance once it meets its target allocation.

Mr. Nield reported on the performance of the Low Volatility with Overlay portfolio. He stated that the return was 6.1 percent for the one-year period and 3.6 percent since inception. He explained how the portfolio was constructed. In response to a question from Dr. Brown, Dr. Balachandran explained that the market pays if value and quality stock is selected and that, since low volatility with overlay stocks have proven to be well correlated with quality, the result is steady earnings and return over time.

Mr. Auby discussed the asset allocation initiative for the new currency hedging portfolio. He stated that it is a research and development portfolio launched earlier this year to address currency hedging within the trust by monitoring current risks and building in protection.

Mr. Auby concluded the presentation by presenting 2016 priorities for the Risk Group: (1) continuing to increase Risk Parity allocation and enhance research; (2) enhancing Risk Parity technology infrastructure; (3) researching non-US developed and emerging markets; (4) investigating asset allocation regime signals from external partners and considering their applicability to the bubble process; (5) partnering with other groups to review internal portfolio construction; and (6) hosting the 2016 Canadian Risk Conference.

3. Review Asset Allocation – Mohan Balachandran.

Dr. Balachandran reviewed the 2015 performance of the portfolios managed by the Asset Allocation Group. He reported that 2015 was a positive year for the Tactical Asset Allocation (TAA) Portfolio, which yielded an 8.9 percent return, while the TIPS Portfolio was down 0.6 percent. He noted that both portfolios had low tracking errors of less than 20 basis points. He reported that the Quantitative Equity Strategies Portfolio was down 4 percent, but its alpha was 1.6 percent. He reported that the special opportunities platform had a return of 3.8 percent in an environment where equities were down about 6 percent and high yield markets were off about 4 percent.

Dr. Balachandran reviewed 2015 accomplishments, including the implementation of the SAA study, the rollout of the quantitative equity platform, initial success in the special opportunities platform, and the completion of the alternative risk premia portfolio.

Dr. Balachandran provided an organizational overview of the TAA group and profiled each team, their portfolios, functions, and 2016 goals. The goal of the Treasury team led by Komson Silapachai was effective index replication with low tracking error. He noted that the team also managed trust liquidity in all transitions. He confirmed for Mr. Colonna that the portfolio was traded to keep it in line with the index because the index changes over time. The goal of the Quantitative Equity Team led by Mark Albert was 100 basis points of alpha. He noted that the performance of the team at one year, three years, and since-inception had been well in excess of its goal of 100 basis points of alpha. He stated that the team collaborated and worked closely with the Risk Group on the Low Volatility with Overlay portfolio. Dr. Balachandran also discussed the Special Opportunities Platform led by Ashley Baum that actively collaborated with all profit centers. He stated that this portfolio accesses investments that other groups do not want to pursue. He also said that this team would continue to work with the private markets and public markets teams to enhance collaboration on a number of investment ideas. He stated that 2015 was a slow year for this team with \$200 million in assets. He then discussed the TAA Portfolio. He stated that

the goal of the TAA led by Dr. Matt Talbert and Jean-Benoit Daumerie was to generate 25 basis points of alpha. He noted one of the team's accomplishments was developing a common language with the Strategic Partnership Networks (SPNs). Dr. Talbert noted that with a common language the TAA now had access on a weekly basis to SPN positioning and reporting detail.

Dr. Balachandran addressed performance, stating that the primary risk came from trust positioning in long U.S. equities and EAFE, or non-U.S. developed equities. He stated that performance was halfway to the target of 25 basis points of alpha and that a good portion of the negative performance from last year had been recovered. Dr. Talbert highlighted four key areas of active research planned to assist the team in reaching target goals in 2016: (1) enhancing the use of strategic partner knowledge, resources and actual positions; (2) building the team's capabilities to use alternative risk premia investment strategies; (3) working with the Risk Group and monitoring signals for assets traded; and (4) refining the process for evaluating research and development in existing models. Responding to a question from Dr. Brown, Dr. Balachandran confirmed that information gathered by this team was shared with other portfolios in the trust. He stated that the internal public markets team reviews the TAA's positioning and models and provides feedback. He agreed with Dr. Brown that communication should be continued and encouraged. He noted that the management committee reviews performance and positioning on a monthly basis.

Mr. Balachandran concluded his presentation by presenting the 2016 goals. He stated that the team would continue to effectively implement the SAA transition, monitor the special opportunities platform, and continue research on applications of Quantitative Equity strategies.

The meeting adjourned at 2:11 p.m.

APPROVED BY THE INVESTMENT MANAGEMENT COMMITTEE OF THE BOARD OF TRUSTEES OF THE TEACHER RETIREMENT SYSTEM OF TEXAS ON THE 7TH DAY OF APRIL, 2015.

ATTESTED BY:

Dan Junell
Secretary to the TRS Board of Trustees

Date





Internal Active Management

Chi Kit Chai, Senior Managing Director

Patrick Cosgrove, Senior Director

KJ Van Ackeren, Senior Director

April 2016

Agenda

Overview

- TRS IMD Internal Active Management

Internal Actively Managed Equity Portfolios

- TRS Investment Division
- IPM Organizational Chart

Market Update

- Regional Returns
- Sector Returns

GBI Update

- Investment Results
- Competitive Landscape
- Regional Performance
- US Active Manager Performance
- Region and Sector Positioning
- Fundamental Characteristics
- Performance Attribution and Risk
- Top Holdings and Overweights

GBI Gold

- Investment Results

GBI High Quality

- Investment Results

Accomplishments and Priorities

Summary

Appendix

TRS IMD Internal Active Management

Overview

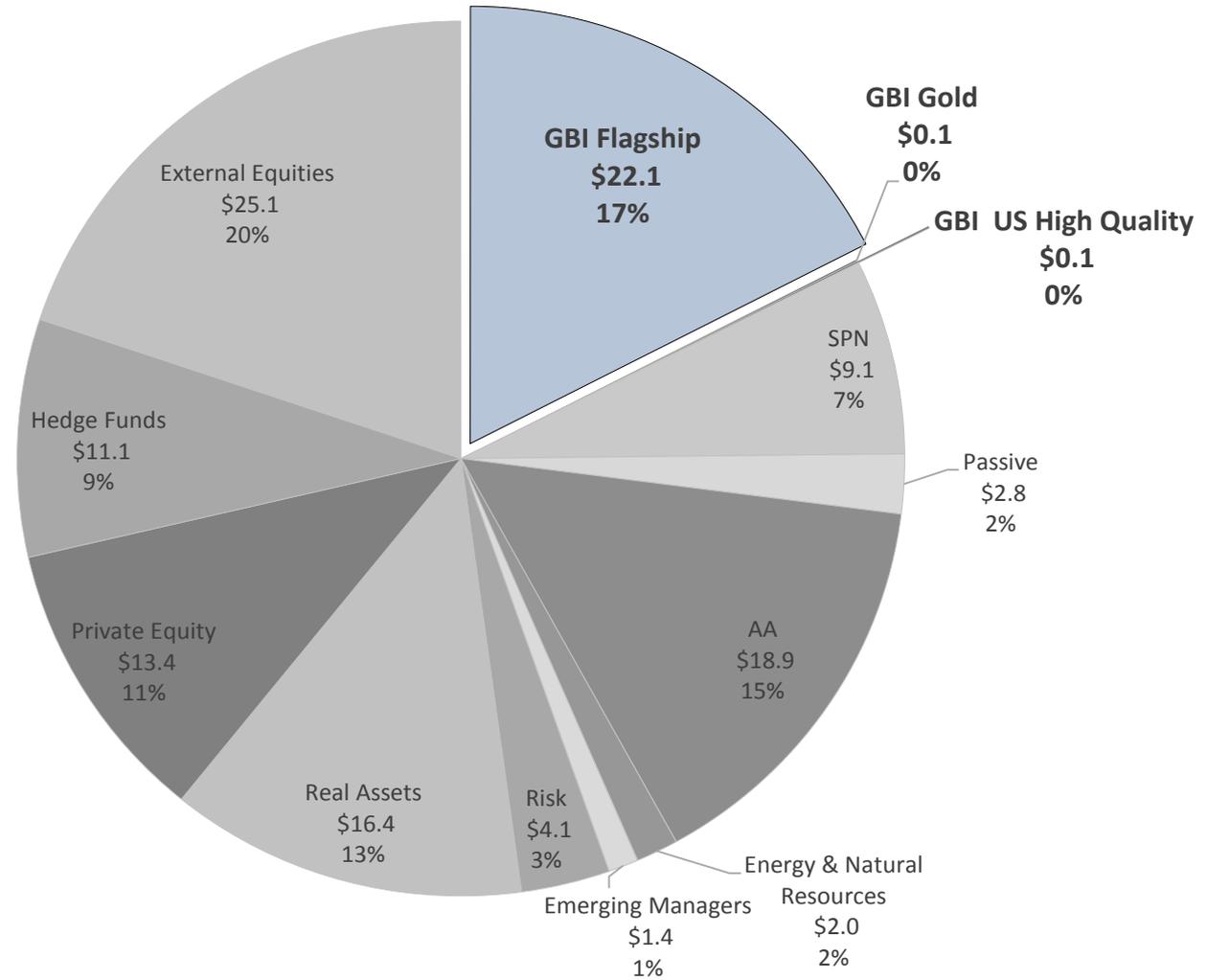
Internal Active Management							
<ul style="list-style-type: none"> • \$22 billion managed actively (17% of TRS Portfolio) • Experienced investment and trading teams 				<ul style="list-style-type: none"> • Well developed investment processes with effective risk management • Annual cost savings of approximately \$100 million 			
Active Portfolios							
Global Best Ideas (GBI)	AUM (\$M)	ALPHA				Tracking Error	Information Ratio
		1 Yr	3 Yrs	5 Yrs	ITD		
Core	\$ 19,121	0.7%	0.3%	0.4%	0.5%	1.2%	0.42
Quant	2,559	0.2%	2.6%	1.7%	2.2%	1.9%	1.15
Alpha Opportunity	442	16.7%	6.4%		5.2%	14.1%	0.37
Flagship	22,122	0.9%	0.5%	0.4%	0.6%	1.2%	0.46
Gold	89	6.7%	4.1%	3.6%	3.2%	4.9%	0.66
US High Quality	101	7.4%	3.3%		2.2%	3.6%	0.60
Total	\$ 22,312						
GBI Flagship Portfolio Characteristics				GBI Flagship Factor Exposures			
Characteristics	Data	Factor	% of Risk				
Predicted Beta	1.0	Stock Specific	61				
Price/Earnings - Trailing	16.1x	Region/Currency	18				
Price/Earnings - Forward	14.9x	Sector	7				
Price/Book	1.9x	Valuation	4				
Dividend Yield	2.5%	Beta	3				
ROE	16.6%	Volatility	3				
EPS Growth	10.6%	Liquidity	2				
Debt/Capital	38.2%	Growth	0				
Realized Tracking Error	122 bps	Size	0				
GBI Flagship Key Policies							
Benchmark: MSCI ACWI USA Gross and Int'l Net				Target Alpha: 50 basis points			
Regions	BM Weight	Risk Ranges					
United States	53%	Tracking Error: 0 to 200 basis points					
Europe	22%	Regional Allocation: -3% to +3%					
Asia Ex Japan	8%	Sector Allocation: -3% to +3%					
Japan	8%						
Latin America & EMEA	3%						
Other	5%						
	100%						



Internal Public Markets

Investment Management Division as of December 31, 2015

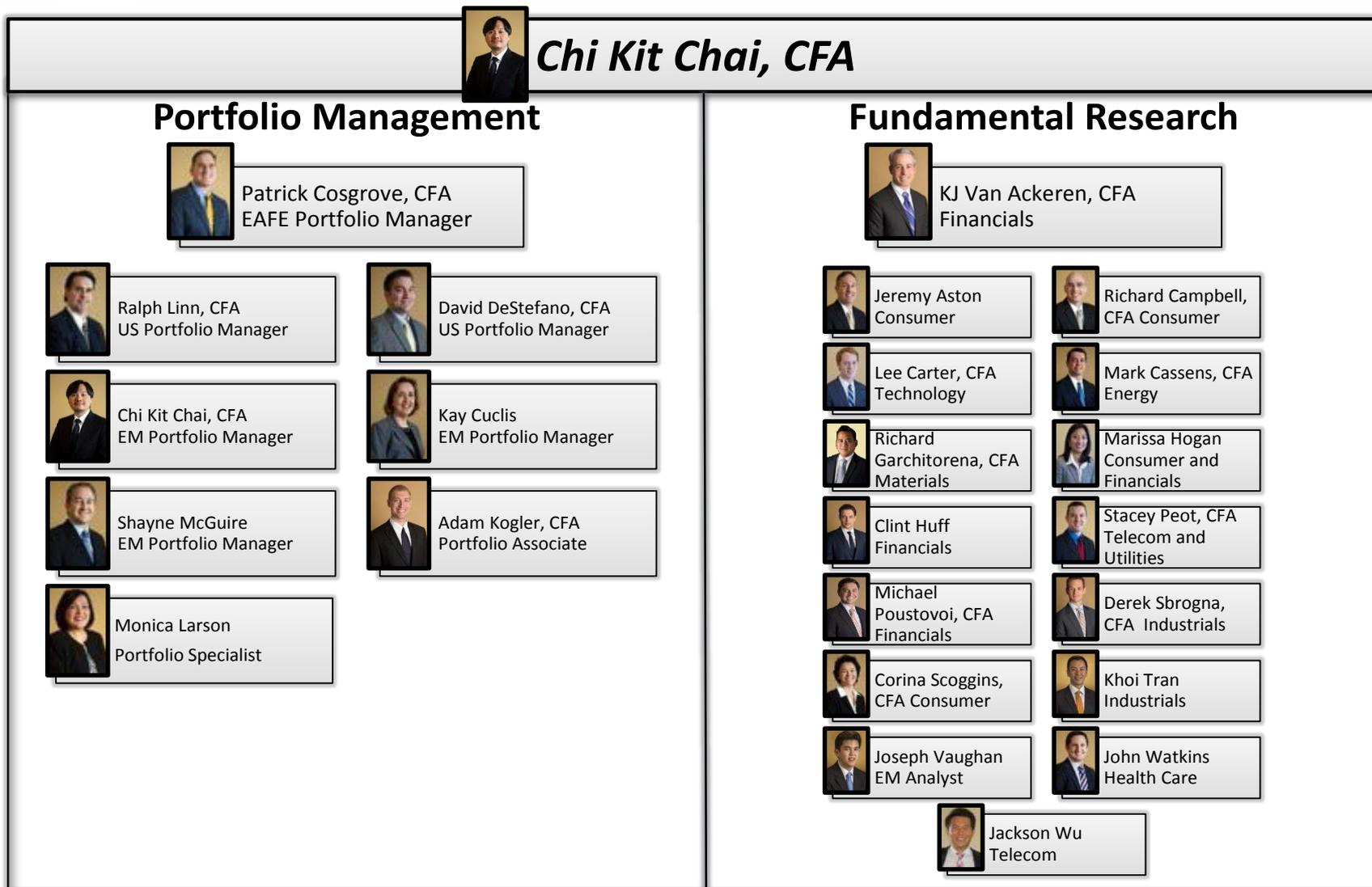
**Total Trust Value:
\$127 billion**



Source: State Street Bank

Internal Public Markets

Organizational Chart



Global Regional Returns (US Dollar)

Annual						Annualized	
2015	2014	2013	2012	2011	2010	3 Year	5 Year
Japan 10%	United States 13%	United States 32%	Asia Ex JP 22%	United States 1%	Canada 20%	United States 14%	United States 12%
United States 1%	Asia Ex JP 5%	Japan 27%	Australia 22%	MSCI AC World -7%	Asia Ex JP 20%	Japan 10%	MSCI AC World 6%
MSCI AC World -2%	MSCI AC World 4%	Europe 25%	Europe 19%	Australia -11%	EMEA & LA 19%	MSCI AC World 8%	Japan 4%
Europe -3%	Canada 2%	MSCI AC World 23%	MSCI AC World 16%	Europe -11%	Japan 15%	Europe 5%	Europe 4%
Asia Ex JP -9%	Australia -3%	Canada 6%	United States 15%	Canada -13%	United States 15%	Asia Ex JP -1%	Asia Ex JP 0%
Australia -10%	Japan -4%	Australia 4%	EMEA & LA 14%	Japan -14%	Australia 15%	Australia -3%	Australia 0%
Canada -24%	Europe -6%	Asia Ex JP 3%	Canada 9%	Asia Ex JP -17%	MSCI AC World 13%	Canada -7%	Canada -5%
EMEA & LA -25%	EMEA & LA -14%	EMEA & LA -10%	Japan 8%	EMEA & LA -20%	Europe 4%	EMEA & LA -17%	EMEA & LA -12%



Benchmark: MSCI ACWI
Source: Factset, MSCI

Global Sector Returns (US Dollar)

Annual						Annualized	
2015	2014	2013	2012	2011	2010	3 Year	5 Year
Health Care 6%	Health Care 18%	Discretionary 36%	Financials 29%	Health Care 9%	Discretionary 25%	Health Care 19%	Health Care 17%
Staples 5%	Technology 15%	Health Care 36%	Discretionary 23%	Staples 8%	Industrials 24%	Technology 15%	Discretionary 11%
Discretionary 4%	Utilities 14%	Industrials 29%	Health Care 18%	Telecom 0%	Materials 22%	Discretionary 14%	Technology 11%
Technology 3%	Staples 6%	Technology 27%	MSCI AC World 16%	Energy -3%	Staples 14%	Staples 10%	Staples 10%
Telecom -2%	MSCI AC World 4%	Telecom 24%	Industrials 16%	Technology -4%	MSCI AC World 13%	Industrials 8%	MSCI AC World 6%
MSCI AC World -2%	Discretionary 3%	MSCI AC World 23%	Technology 15%	Utilities -5%	Energy 12%	MSCI AC World 8%	Industrials 6%
Industrials -3%	Financials 3%	Financials 22%	Staples 15%	Discretionary -5%	Technology 11%	Financials 6%	Telecom 5%
Financials -6%	Industrials 0%	Staples 18%	Materials 11%	MSCI AC World -7%	Telecom 11%	Telecom 6%	Financials 4%
Utilities -8%	Telecom -2%	Energy 14%	Telecom 8%	Industrials -10%	Financials 6%	Utilities 5%	Utilities 2%
Materials -16%	Materials -7%	Utilities 11%	Energy 2%	Financials -19%	Health Care 3%	Materials -8%	Energy -5%
Energy -22%	Energy -13%	Materials -1%	Utilities 2%	Materials -21%	Utilities 0%	Energy -9%	Materials -8%



Benchmark: MSCI ACWI
Source: Factset, MSCI

GBI Flagship

Performance as of December 31, 2015

GBI FLAGSHIP (Inception – December 2007)

Year	AUM (\$ in billions)	Investment Return (%)	Alpha (bps)
2015	22.1	-1.2	90
2014	22.3	4.5	27
2013	23.1	23.1	31
2012	20.4	16.8	65
2011	18.2	-7.3	7
2010	19.4	12.8	16
2009	16.7	35.4	77
2008	12.1	-41.5	72
2007	3.9	2.8	43

GBI FLAGSHIP (Inception – December 2007)

Annualized	Investment Return (%)	Alpha (bps)	Risk Metrics	
			Tracking Error ¹	Information Ratio ²
1-Year	-1.2	90	0.9%	1.0
3-Year	8.4	51	0.8%	0.6
5-Year	6.6	44	0.9%	0.5
Since Inception	3.0	56	1.2%	0.5

GBI US HIGH QUALITY (Inception – July 2011)

Year	AUM (\$ in millions)	Investment Return (%)	Alpha (bps)
2015	101	8.0	739
2014	98	16.5	318
2013	102	31.3	-134
2012	99	17.5	117
2011	100	-4.8	-86

GBI CORE (Inception – December 2007)

Year	AUM (\$ in billions)	Investment Return (%)	Alpha (bps)
2015	19.1	-1.3	71
2014	20.9	4.3	9
2013	22.1	23.1	16
2012	19.8	16.8	66
2011	17.6	-7.1	23
2010	19.0	12.8	9
2009	16.4	35.3	67
2008	12.1	-41.6	59
2007	3.9	2.8	37

GBI QUANT (Inception – June 2009)

Year	AUM (\$ in millions)	Investment Return (%)	Alpha (bps)
2015	2,559	-1.9	17
2014	1,059	6.9	266
2013	1,015	28.2	545
2012	547	18.6	245
2011	250	-8.4	-101
2010	182	14.2	158
2009	170	23.8	449

GBI ALPHA OPPORTUNITY (Inception – October 2012)

Year	AUM (\$ in millions)	Investment Return (%)	Alpha (bps)
2015	442	14.7	1672
2014	321	8.0	377
2013	79	23.1	33
2012	64	-0.02	-214



¹ Tracking Error: annualized standard deviation of monthly excess returns

² Information Ratio: annualized excess returns/tracking error

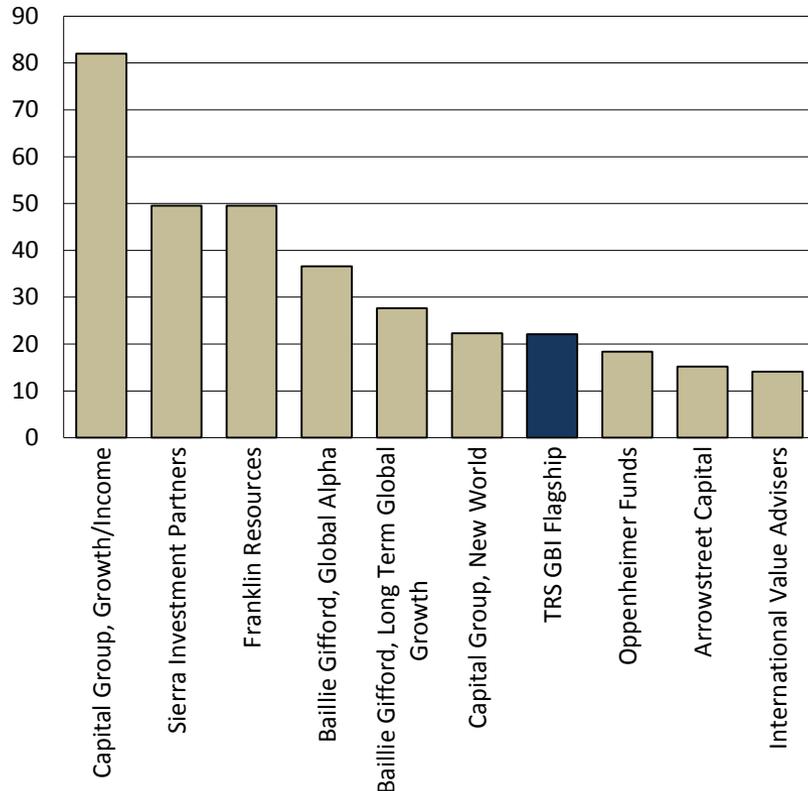
Source: State Street Bank

Note: As of 10/1/2014, the GBI benchmark has changed from MSCI-ACWI Net to MSCI-ACWI USA Gross and Int'l Net

As of 10/1/2014, the GBI US High Quality benchmark has changed from MSCI USA Gross to MSCI USA IMI

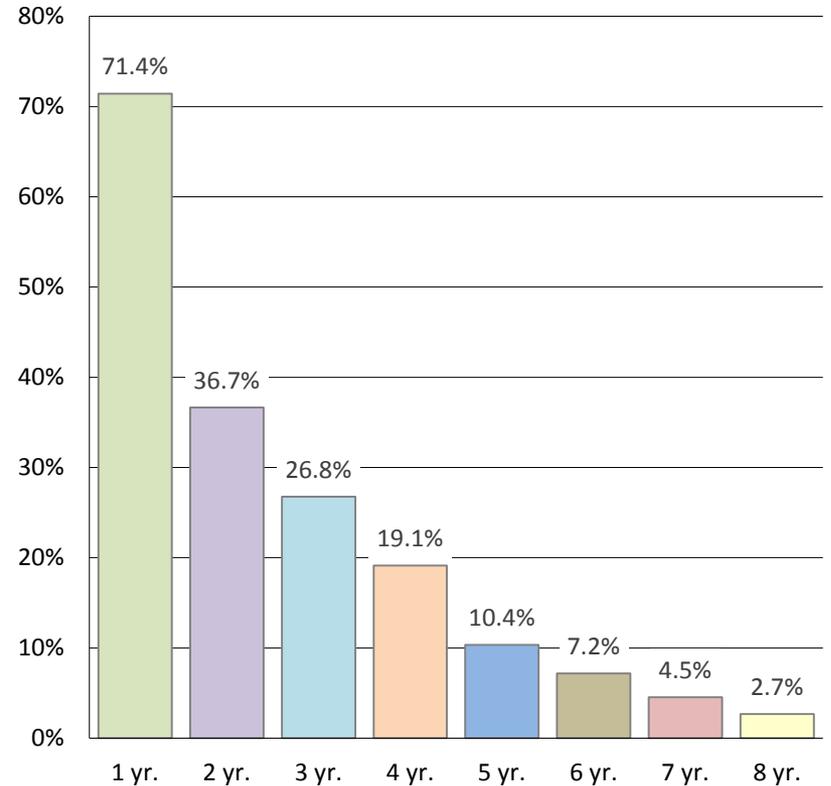
GBI Flagship Competitive Landscape

Ten Largest Actively Managed Global Funds, AUM (\$ billions)



7th Largest Global Fund

Percentage of Global Equity Funds Outperforming Their Benchmarks in Consecutive Years



Less than 3% have 8 Consecutive Years of Alpha



Benchmark: MSCI ACWI
Source: eVestment

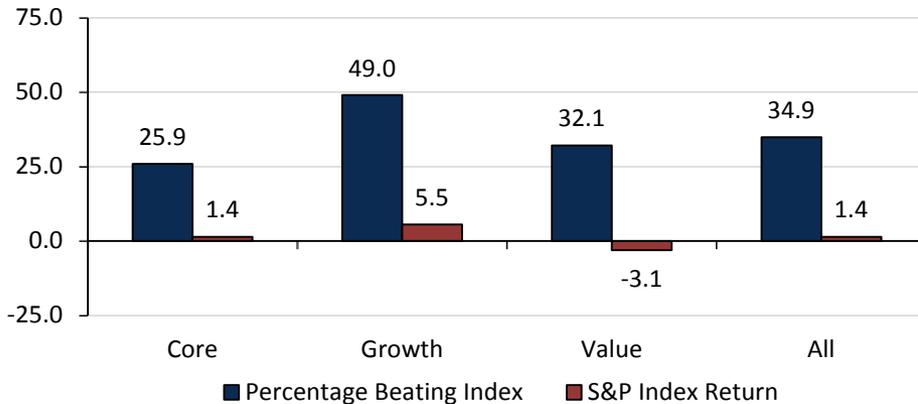
GBI Flagship Regional Performance

	Returns (%)		Alpha (bps)		Information Ratio		Peer Ranking Information Ratio	
	1 Year	3 Year	1 Year	3 Year	1 Year	3 Year	1 Year	3 Year
GBI Flagship	-1.2	8.4	90	51	1.02	0.63	Q2	Q2
GBI US	0.3	14.1	-95	-91	-1.16	-1.10	Q3	Q4
GBI EAFE	0.5	6.0	354	205	2.06	1.21	Q1	Q1
GBI EM	-12.0	-3.8	287	292	1.42	1.33	Q1	Q1

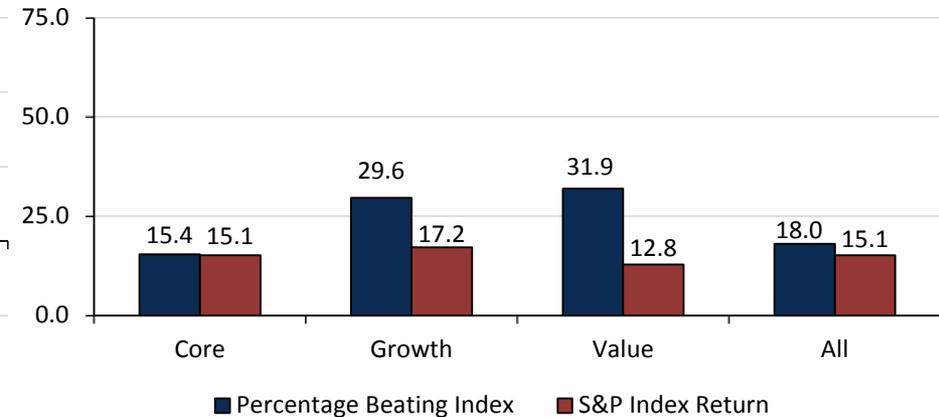
- US performance has been challenged
- International alpha has been strong and consistent, particularly in Emerging Markets and Europe

US Active Manager Performance in 2015

1 year



3 year



- 2015 continued to be a difficult environment for active management within the US, especially for core managers
- 35% of active managers beat the S&P 500 in 2015, but only 18% outperformed over the last 3 years

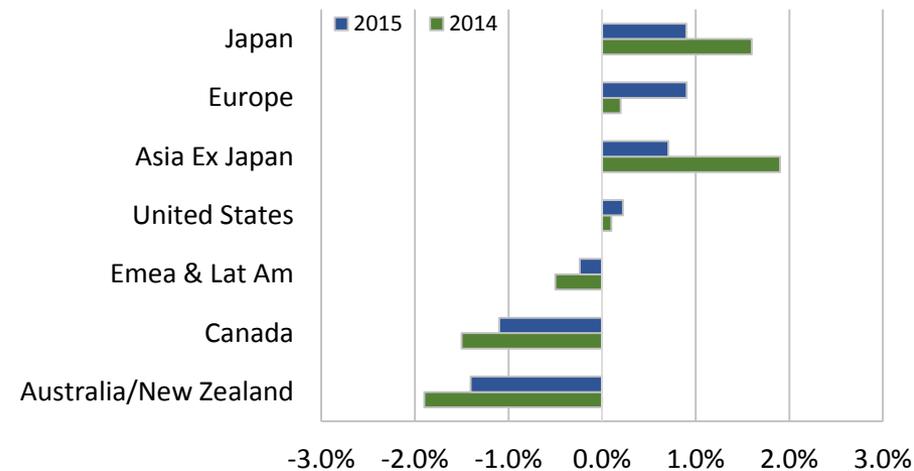
GBI Flagship

Positioning as of December 31, 2015

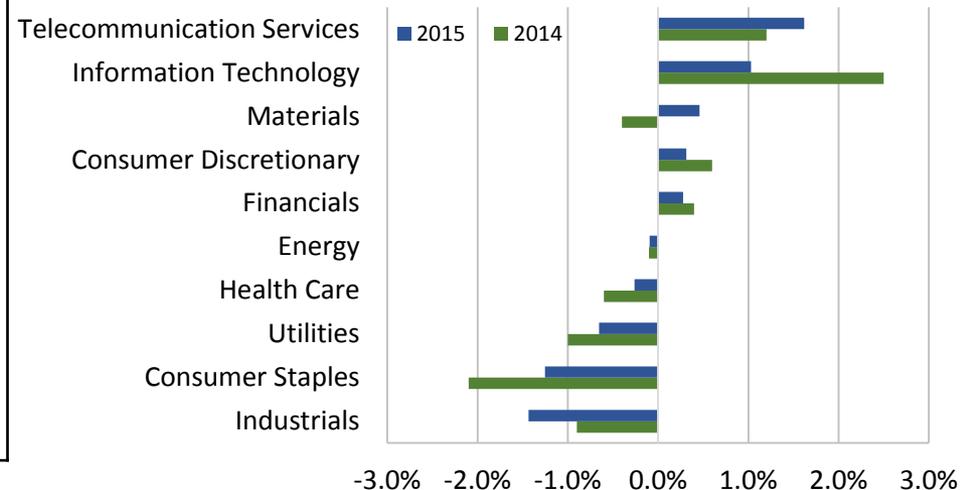
Regions	GBI		Over/Under	
	2015	2014	2015	2014
Japan	9.0%	8.8%	0.9%	1.6%
Europe	23.0%	22.5%	0.9%	0.2%
Asia Ex Japan	9.2%	10.3%	0.7%	1.9%
United States	53.5%	52.5%	0.2%	0.1%
EMEA & Lat Am	2.6%	3.2%	-0.2%	-0.5%
Canada	1.7%	2.1%	-1.1%	-1.5%
Australia/New Zealand	1.0%	0.7%	-1.4%	-1.9%

Sectors	GBI		Over/Under	
	2015	2014	2015	2014
Telecommunication Svcs.	5.3%	5.0%	1.6%	1.2%
Information Technology	15.9%	16.3%	1.0%	2.5%
Materials	5.0%	5.0%	0.5%	-0.4%
Consumer Discretionary	13.3%	12.6%	0.3%	0.6%
Financials	21.8%	22.2%	0.3%	0.4%
Energy	6.1%	7.9%	-0.1%	-0.1%
Health Care	12.3%	11.0%	-0.3%	-0.6%
Utilities	2.5%	2.4%	-0.7%	-1.0%
Consumer Staples	9.0%	7.6%	-1.3%	-2.1%
Industrials	8.9%	9.6%	-1.4%	-0.9%

GBI Relative Region Weights



GBI Relative Sector Weights



Benchmark: MSCI ACWI
Source: Factset, TRS IMD

GBI Flagship

Portfolio Characteristics as of December 31, 2015

	Portfolio Characteristics	GBI Flagship ¹			MSCI ACWI ¹		
		2015	2014	3/9/2009	2015	2014	3/9/2009
Valuation Metrics	Market Capitalization	\$101.2B	\$97.7B	\$43.2B	\$94.2B	\$91.4B	\$42.5B
	Price/Earnings – Trailing	16.1x	16.1x	9.7x	17.2x	17.0x	9.5x
	Price/Earnings – Forward	14.9x	14.8x	9.0x	15.9x	15.8x	9.0x
	Price/Book	1.9x	2.0x	1.6x	1.9x	2.1x	1.5x
	Dividend Yield	2.5%	2.2%	3.2%	2.6%	2.4%	3.8%
Quality Metrics	Estimated 3-5yr EPS Growth	10.6%	12.1%	8.5%	10.4%	11.1%	7.6%
	Return on Equity	16.6%	17.7%	20.6%	15.8%	17.2%	20.5%
	Long-Term Debt/Capital	38.2%	35.5%	31.0%	37.1%	35.3%	32.2%
Risk Metrics	Beta	1.0	1.0	1.0	1.0	1.0	1.0

GBI Flagship

Performance Attribution and Risk

GBI Flagship Relative Performance and Risk

	2015	2014	2013	2012	2011	2010	2009	2008	2007	Cumulative	Annualized	
											3-Year	ITD
Alpha Attribution (bps)												
Stock	22	38	62	33	(7)	(10)	27	6	41	178	34	18
Region	59	10	(33)	37	5	21	49	17	1	289	12	30
Sector	9	(21)	2	(5)	9	5	1	49	1	79	5	8
Total	90	27	31	65	7	16	77	72	43	547	51	56
Risk Factors (%)										Average		
Stock Specific	61%	48%	46%	46%	33%	32%	49%	53%	52%	47%	52%	47%
Region	18%	17%	23%	31%	34%	34%	14%	5%	7%	20%	19%	20%
Sector	7%	7%	9%	11%	21%	14%	12%	9%	5%	11%	8%	11%
Volatility/Beta	6%	19%	18%	4%	7%	12%	7%	2%	7%	9%	14%	9%
Value	4%	0%	1%	-1%	0%	0%	0%	3%	6%	1%	2%	1%
Liquidity	2%	1%	1%	1%	0%	1%	0%	0%	1%	1%	1%	1%
Momentum	1%	7%	1%	7%	4%	5%	13%	22%	13%	8%	3%	8%
Growth	0%	1%	2%	1%	0%	2%	3%	2%	3%	2%	1%	2%
Size	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Leverage	0%	0%	0%	1%	0%	0%	2%	3%	5%	1%	0%	1%
Total	100%	100%	100%									



Benchmark: MSCI ACWI
Source: Factset, MSCI Barra, TRS IMD

This slide was intentionally left blank.

GBI Gold

Performance as of December 31, 2015

GBI GOLD¹

Year	AUM (\$ in millions)	Investment Return (%)	Alpha (bps)	Information Ratio
2015	89	-15.8	669	1.0
2014	104	2.6	1331	2.0
2013	198	-44.2	-341	-0.6
2012	816	2.0	233	0.9
2011	705	-5.8	248	0.8
2010	491	35.3	57	1.3
2009 ²	266	5.2	-3	-0.9
Inception ²	n/a	-6.5	322	0.7

- GBI Gold portfolio outperformed by 669 basis points in 2015
 - Gold – down 10%
 - Silver – down 12%
 - The XAU precious metals index – down 34%



¹Custom Benchmark (50% XAU Index, 35% GLD US, 15% SLV US)

²Inception: October 2009

Source: State Street Bank, TRS IMD

GBI US High Quality

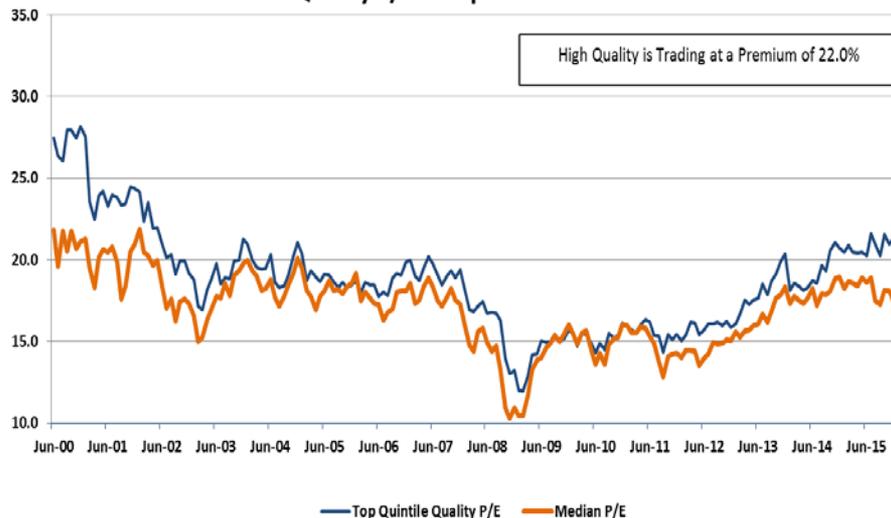
Performance as of December 31, 2015

GBI US HIGH QUALITY

Year	AUM (\$ in millions)	Investment Return (%)	Alpha (bps)
2015	101	8.0	739
2014	98	16.5	318
2013	102	31.3	-134
2012	99	17.5	117
2011 ¹	100	-4.8	-86

- Performance since inception has been in line with peers
- Outperformed peers in 2015

Quality P/E Compared to Market



US High Quality Top Quintile FY1 PE Premium to Median



¹Inception: July 2011

As of 10/1/2014, the GBI US High Quality benchmark has changed from MSCI USA Gross to MSCI USA IMI

Source: State Street Bank, TRS IMD

IPM Accomplishments and Priorities

2015 Accomplishments

Implemented new IPM process of "Fishing Holes"

Implemented Texas Way valuation

Expanded Alpha Opportunity portfolio

Developed screening tools based on external managers' best ideas

Developed career crafting across IPM

2016 Priorities

Increase effective collaboration across IMD

Enhance US quantitative and sector allocation models

Develop sell-side skill tracking tool

Develop individual stock dislocation analysis

Evaluate resources dedicated to non-Europe EAFE

Evaluate resources dedicated to Alpha Opportunity

Develop EM/DM dashboard

Summary

Internal Active Equity Portfolio Management

- GBI continued to outperform in 2015
 - Highest calendar year alpha generation
- This is the 8th consecutive year of GBI outperformance
 - Less than 3% of global equity funds have matched GBI's consistency
- Since inception, GBI has produced an annualized alpha of 56 basis points versus the 50 basis point target

APPENDIX

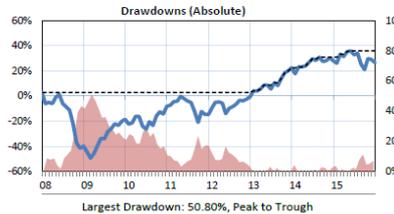
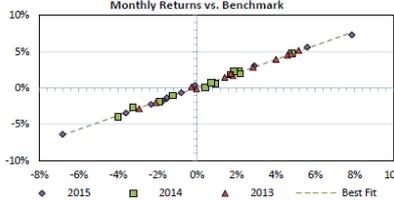
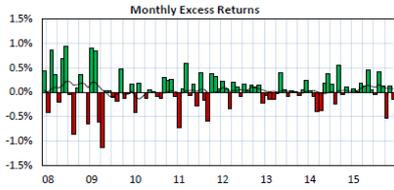
GBI Flagship STAR Report



GBI Flagship vs. MSCI ACWI (US Gross & Int'l Net)

Statistical Tracking And Reporting (STAR) Report

Monthly Data from 12/07 to 12/15



Performance by Period (Inception: 12/31/07)

Period	Portfolio	B'mark	VFB	T.E.	I.B.
3-month	4.60%	5.12%	(0.52%)		
YTD	(1.15%)	(2.04%)	0.90%		
1-year	(1.15%)	(2.04%)	0.90%	0.88%	1.02
2-year	1.64%	1.05%	0.60%	0.92%	0.64
3-year	8.35%	7.83%	0.51%	0.81%	0.63
5-year	6.61%	6.17%	0.44%	0.90%	0.49
10-year	N/A	N/A	N/A	N/A	N/A
Inception	2.96%	2.40%	0.56%	1.22%	0.46

Performance by Year:

Year	Portfolio	B'mark	Excess	
Start Date:				
12/31/07	2008	2.82%	2.39%	0.43%
	2009	(41.49%)	(42.21%)	0.72%
	2010	12.83%	12.67%	0.16%
End Date:	2011	(7.27%)	(7.35%)	0.07%
	2012	16.78%	16.13%	0.65%
	2013	23.11%	22.80%	0.31%
	2014	4.51%	4.24%	0.27%
	2015	(1.15%)	(2.04%)	0.90%

Valuation Model

Overall Performance (Since Inception 12/31/07)

Cumulative Performance:

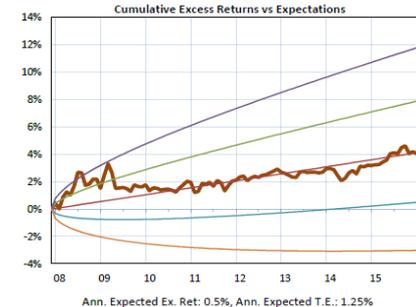
Portfolio	Benchmark	Excess Return	Periods	R-Squared	Tracking Error
26.6%	21.1%	5.5%	97	99.6%	1.22%

Annualized Performance:

	Portfolio	B'mark	Diff	Ex. Ret.	Risk Free
Return	2.96%	2.40%	0.56%	0.49%	0.32%
St. Dev.	17.94%	18.21%	(0.28%)	1.22%	0.22%
Best Month	11.10%	11.80%	(0.71%)	0.95%	0.38%
Worst Month	(19.47%)	(19.82%)	0.35%	(1.14%)	(0.01%)
Skew	(0.71)	(0.69)		-0.20	
Kurtosis	1.64	1.65		1.62	
Best 12 Mths	55.62%	58.12%			
Worst 12 Mths	(46.77%)	(48.21%)			
Up Capture	57.52%	57.87%			
Down Capture	(38.31%)	(39.21%)			

Risk Summary:

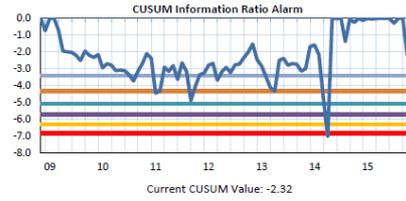
Info. Ratio	0.46	Sharpe	0.15	Hit Rt Up	47%
M2 Premium	3.00%	Treynor	0.03	Hit Rt Dn	70%
Beta	0.98	Sortino	0.13	Hit Rt Tot	58%
Jensen's alpha	0.60%	5% hVar	(0.59%)		



GBI Flagship vs. MSCI ACWI (US Gross & Int'l Net)

Statistical Tracking And Reporting (STAR) Report

Monthly Data from 12/07 to 12/15

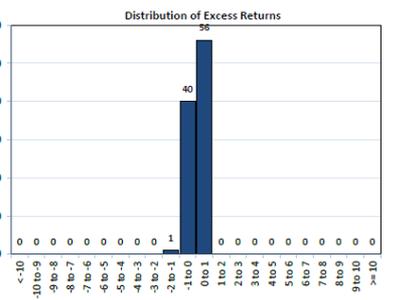
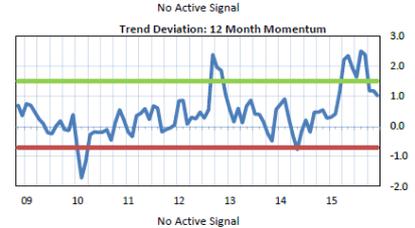


Hit Rate Analysis:

	Periods	Hit Rate	Avg Ex Ret
Benchmark Up	53	47.2%	(0.02%)
Benchmark Down	44	70.5%	0.12%
All Periods	97	57.7%	0.04%

Hit Rate During Various Environments:

Value/ Growth	Value	Neutral	Growth
Periods	22	52	23
Hit Rate	27.3%	57.7%	87.0%
Avg Ex Ret	(0.19%)	0.02%	0.32%
Sm Value/ Sm Growth	Value	Neutral	Growth
Periods	18	59	20
Hit Rate	33.3%	57.6%	80.0%
Avg Ex Ret	(0.16%)	0.01%	0.33%
Equity Size	Large	Neutral	Small
Periods	21	43	33
Hit Rate	38.1%	69.8%	54.5%
Avg Ex Ret	0.02%	0.06%	0.03%
Core/ High Yield	Core	Neutral	High Yield
Periods	25	34	38
Hit Rate	56.0%	61.8%	55.3%
Avg Ex Ret	0.08%	0.05%	0.01%



US/ Intl Bonds	US	Neutral	Global
Periods	27	46	24
Hit Rate	59.3%	58.7%	54.2%
Avg Ex Ret	0.04%	0.04%	0.04%
Stocks/ Bonds	Stocks	Neutral	Bonds
Periods	48	17	32
Hit Rate	56.3%	58.8%	59.4%
Avg Ex Ret	0.03%	0.02%	0.07%
US/ Intl Stocks	US	Neutral	Intl.
Periods	40	32	25
Hit Rate	55.0%	65.6%	52.0%
Avg Ex Ret	(0.02%)	0.16%	(0.01%)



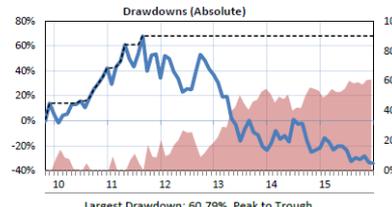
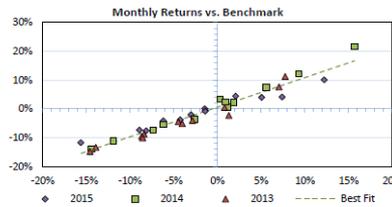
GBI Gold Fund STAR Report



Gold Fund vs. Gold Fund Benchmark

Statistical Tracking And Reporting (STAR) Report

Monthly Data from 10/09 to 12/15



Performance by Period (Inception: 10/31/09)

Period	Portfolio	B'mark	VFB	T.E.	I.R.
3-month	(4.32%)	(3.46%)	(0.86%)		
YTD	(15.83%)	(22.51%)	6.69%		
1-year	(15.83%)	(22.51%)	6.69%	6.81%	0.98
2-year	(7.09%)	(16.84%)	9.75%	6.69%	1.46
3-year	(21.60%)	(25.73%)	4.13%	6.69%	0.62
5-year	(14.27%)	(17.83%)	3.56%	5.46%	0.65
10-year	N/A	N/A	N/A	N/A	N/A
Inception	(6.45%)	(9.63%)	3.18%	4.90%	0.65

Performance by Year:

Year	Portfolio	B'mark	Excess
Start Date: 2009	5.19%	5.21%	(0.03%)
10/31/09	35.30%	34.73%	0.57%
2011	(5.79%)	(8.27%)	2.48%
End Date: 2012	1.99%	(0.33%)	2.33%
2013	(44.17%)	(40.76%)	(3.41%)
2014	2.56%	(10.75%)	13.31%
2015	(15.83%)	(22.51%)	6.69%

Valuation Model

Overall Performance (Since Inception 10/31/09)

Cumulative Performance:

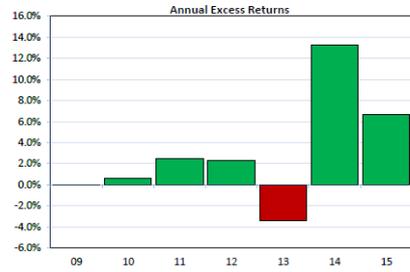
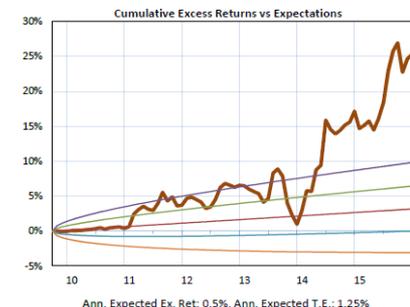
Portfolio	(34.1%)	Periods	75
Benchmark	(46.9%)	R-Squared	96.9%
Excess Return	12.8%	Tracking Error	4.90%

Annualized Performance:

	Portfolio	B'mark	Diff	Ex. Ret.	Risk Free
Return	(6.45%)	(9.63%)	3.18%	3.68%	0.06%
St. Dev.	27.59%	26.31%	1.28%	4.90%	0.02%
Best Month	21.64%	15.74%	5.90%	5.90%	0.02%
Worst Month	(16.88%)	(15.71%)	(1.16%)	(8.61%)	(0.01%)
Skew	0.19	(0.02)		0.77	
Kurtosis	(0.36)	(0.63)		3.66	
Best 12 Mths	42.51%	38.08%			
Worst 12 Mths	(44.17%)	(41.22%)			
Up Capture	106.14%	95.39%			
Down Capture	(56.66%)	(57.35%)			

Risk Summary:

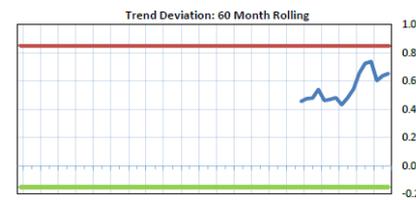
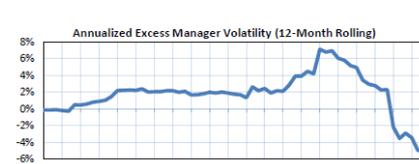
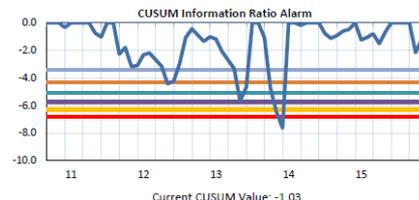
Info. Ratio	0.65	Sharpe	(0.24)	HIT Rt Up	70%
M2 Premium	-6.15%	Treynor	(0.06)	HIT Rt Dn	53%
Beta	1.03	Sortino	(0.25)	HIT Rt Tot	61%
Jensen's alpha	3.50%	5% hVar	(1.36%)		



Gold Fund vs. Gold Fund Benchmark

Statistical Tracking And Reporting (STAR) Report

Monthly Data from 10/09 to 12/15

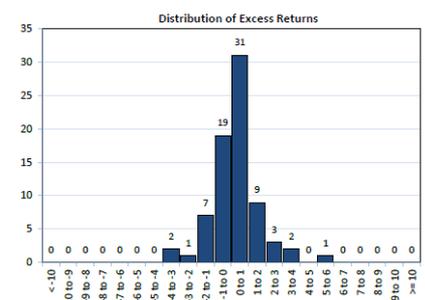


Hit Rate Analysis:

	Periods	Hit Rate	Avg Ex Ret
Benchmark Up	37	70.3%	0.50%
Benchmark Down	38	52.6%	0.12%
All Periods	75	61.3%	0.31%

Hit Rate During Various Environments:

Value/ Growth	Value	Neutral	Growth
	Outperf.		Outperf.
Periods	13	45	17
Hit Rate	61.5%	60.0%	64.7%
Avg Ex Ret	0.31%	0.19%	0.64%
Sm Value/ Sm Growth	Value	Neutral	Growth
	Outperf.		Outperf.
Periods	8	53	14
Hit Rate	50.0%	60.4%	71.4%
Avg Ex Ret	(0.41%)	0.37%	0.51%
Equity Size	Large	Neutral	Small
	Outperf.		Outperf.
Periods	16	35	24
Hit Rate	62.5%	57.1%	66.7%
Avg Ex Ret	0.33%	0.23%	0.42%
Core/ High Yield	Core	Neutral	High Yield
	Outperf.		Outperf.
Periods	17	30	28
Hit Rate	52.9%	53.3%	75.0%
Avg Ex Ret	(0.14%)	0.54%	0.34%



US/ Intl Bonds	US	Neutral	Global
	Outperf.		Outperf.
Periods	21	88	16
Hit Rate	57.1%	60.5%	68.8%
Avg Ex Ret	(0.17%)	0.42%	0.67%
Stocks/ Bonds	Stocks	Neutral	Bonds
	Outperf.		Outperf.
Periods	40	14	21
Hit Rate	62.5%	71.4%	52.4%
Avg Ex Ret	0.36%	0.49%	0.09%
US/ Intl Stocks	US	Neutral	Intl.
	Outperf.		Outperf.
Periods	33	25	17
Hit Rate	54.5%	68.0%	64.7%
Avg Ex Ret	0.05%	0.75%	0.18%

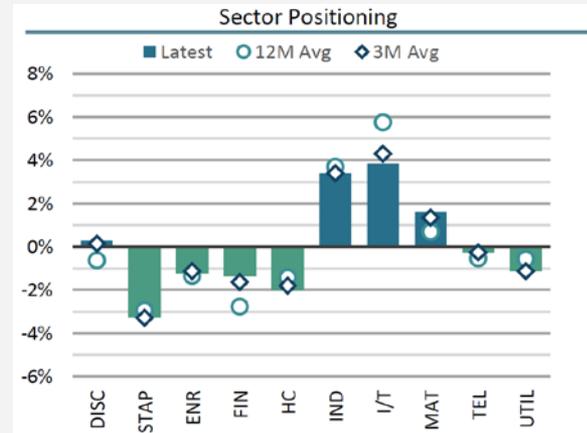


This slide was intentionally left blank.

2016 Priority: Effective Collaboration - EPU Positioning Tools

- **Purpose:** Utilize TRS external manager insight and positions in IPM portfolio management process
- **Tool #1:** Enables team to look up specific stocks that external managers own (and are buying/selling)
- **Tool #2:** Provides access to sector allocation detail, most broadly owned names, and largest OW/UW positions by sector (and country for EM)

Example Data



FH	Information Technology	% +/-	3mo Δ
0	Alphabet Inc. Class C	1.47	+0.03
2	Baidu, Inc. Sponsored ADR Class A	1.34	+0.04
3	Fidelity National Information Services	0.90	-0.11
0	Analog Devices, Inc.	0.74	-0.02
-	Auto Trader Group PLC	0.72	+0.01
3	MasterCard Incorporated Class A	(0.26)	+0.01
4	Taiwan Semiconductor Manufacturin	(0.28)	+0.00
4	International Business Machines Corp	(0.29)	+0.01
1	Microsoft Corporation	(1.10)	-0.25
6	Apple Inc.	(1.47)	+0.20

Top Portfolio Overweights

Alphabet Inc. Class C	+1.47%
Baidu, Inc. Sponsored ADR Class A	+1.34%
Fidelity National Information Servi	+0.90%
Reckitt Benckiser Group plc	+0.86%
AstraZeneca PLC	+0.76%
Analog Devices, Inc.	+0.74%
Auto Trader Group PLC	+0.72%
Willis Towers Watson Public Limite	+0.67%
Capita plc	+0.67%
Amazon.com, Inc.	+0.66%



Trading Annual Review

Bernie Bozzelli, Managing Director
Steve Peterson, Senior Investment Manager
Jaime Llano, Director

April 2016

Agenda

- I. Mandate
- II. Team Profile
- III. Who We Serve
- IV. Trading Partner Network
- V. Broker Certification
- VI. Equity Trading Performance
- VII. Passive Equity Management
- VIII. 2015 Priorities Update
- IX. 2016 Priorities
- X. Appendix

Trading Mandate



Implementation

- **Outperformed the median equity trading desk by six basis points in 2015**, retaining **\$15.6 million** of TRS alpha, placing TRS in the **first quartile** versus our peer universe. TRS trading has placed in the first quartile in five of the last six years. Superior execution is the result of having the right people with the right systems/technology and the right counterparties
- Global execution across multiple asset classes including equities, futures, forwards, foreign exchange, and CDX
- Manage a global network of 41 brokerage firms
- Monitor key variables that contribute to reducing execution costs including volatility, liquidity, and market structure
- Multi-asset execution totaled \$397 billion for 2015 including \$32 billion in Equities, \$267 billion in Futures/Derivatives and \$98 billion in Foreign Exchange



Index Management

- **Passive Management**
 - Manage approximately \$3 billion in U.S., EAFE+Canada, and Emerging Markets
- Benchmark indices are fully replicated in the portfolio in real-time to achieve tight tracking error and in-line performance



Market Intelligence

- **Collaborate across the division to provide implementation solutions.** Work with Asset Allocation, IPM, Risk and EPU to develop optimal implementation strategies
- Examples include assessing the market impact of a trade, transition management between external managers, short-term technical model to aid in the timing of execution, Foreign Exchange (FX) hedging analysis, Options Analysis, Credit Default Swaps (CDX), and value added analysis of Corporate Actions
- **Commission Management**

Trading Team



Bernie Bozzelli, CFA
Managing Director
MPA, Accounting, UT Austin
21 years TRS



Jaime Llano
Director
Futures and Currency
MBA, Finance, St. Edwards
11 years TRS
17 years experience



Demetrius Pope
Senior Investment Manager
Global Equity - Europe
BBA, Sam Houston
9 years TRS
15 years experience



Sean Letcher, CFA
Senior Associate
US Equity and Futures
BS, Business, Texas A&M
4 years TRS
9 years experience



Scott Moore
Senior Investment Manager
Global Equity - Asia
MBA, Thunderbird University
12 years TRS
38 years experience



Steve Peterson
Senior Investment Manager
US Equity and Fixed Income
MBA, California Lutheran University
8 years TRS
21 years experience

3 MBAs
2 CFAs
1 Masters of Accounting
1 BS, Business
21 Years Average Experience



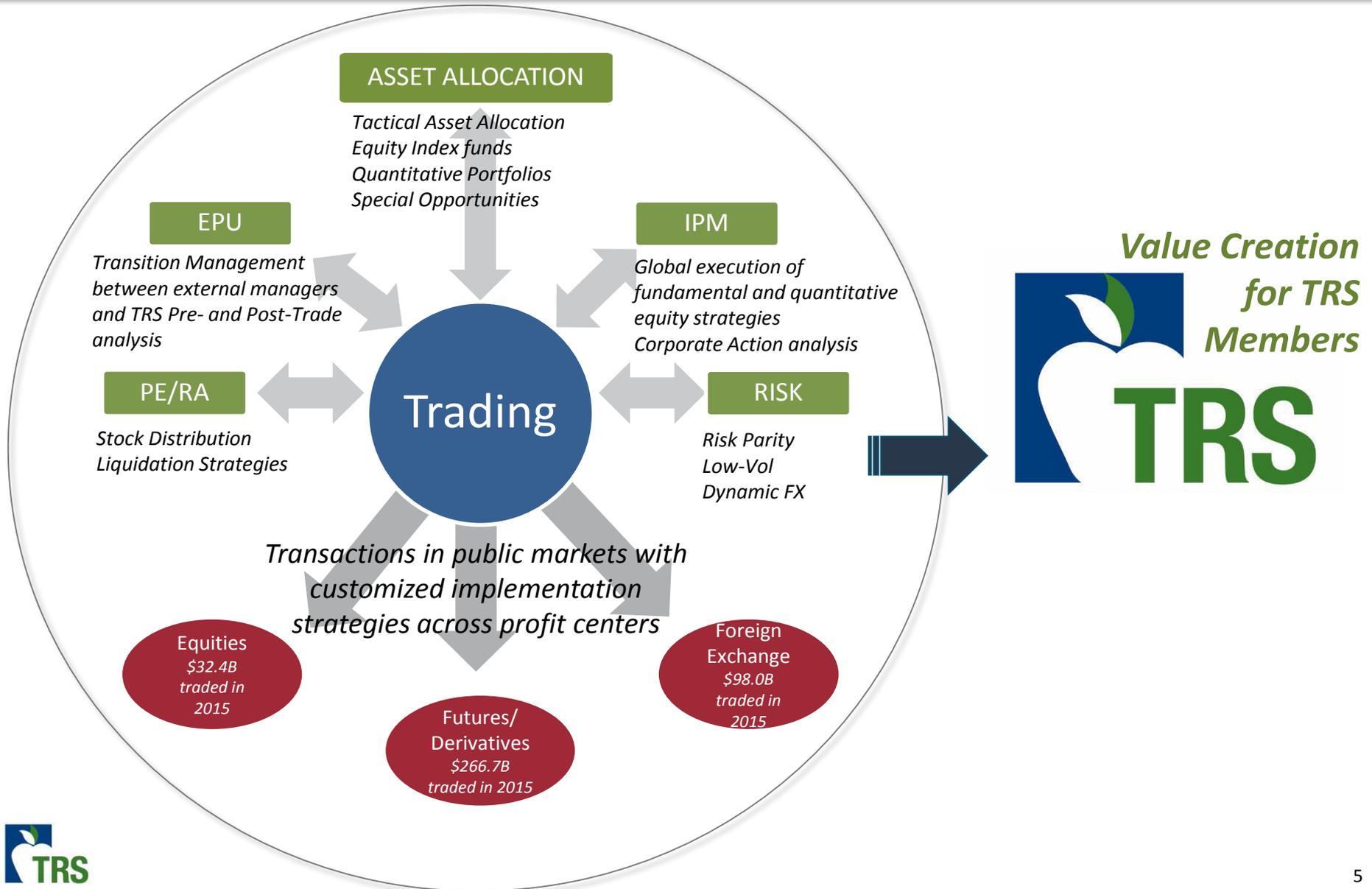
Pat Barker
Senior Analyst
Trading Analyst
27 years TRS
39 years experience



Paige Douthit
Administrative Assistant
Team Support
2 years TRS
7 years experience

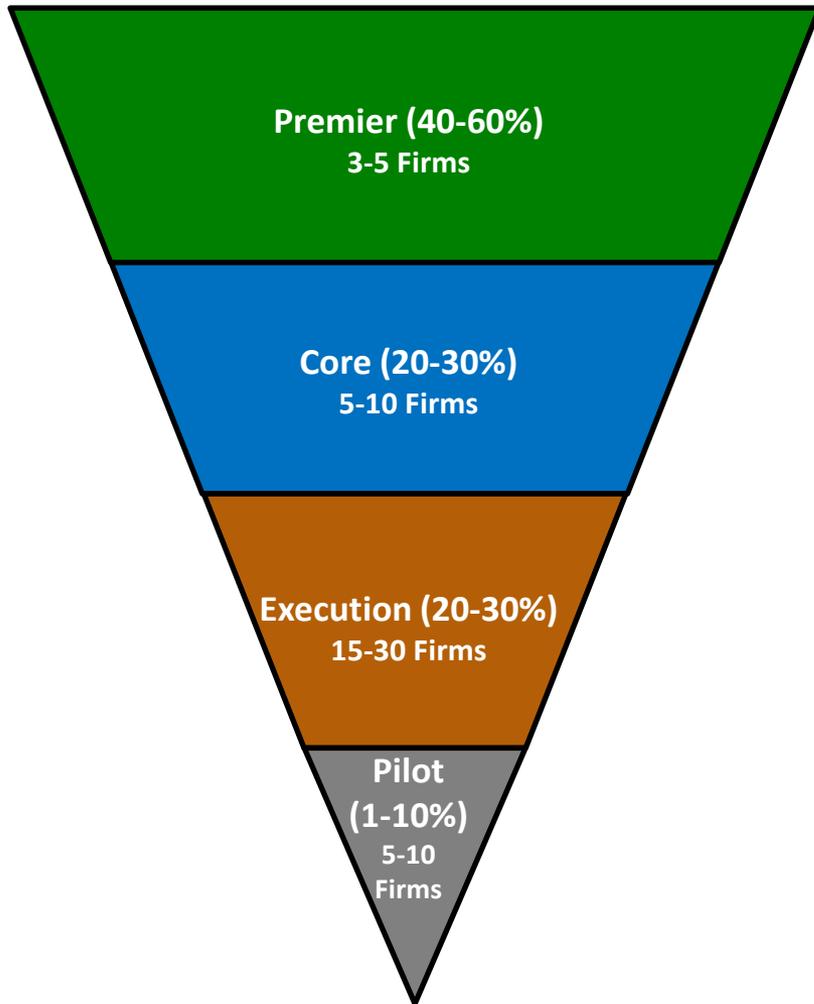
Who We Serve

Cross-Divisional Collaboration



Trading Partner Network

As of December 31, 2015



4 Firms

- Deliver focused and high capacity relationships globally and across all asset classes
- Highly integrated with TRS trading, risk management, administrative systems, etc.
- Leading providers of investment services – TRS is a preferred client, receiving the highest level of service available

5 Firms

- Well established firms with overall world class global services capabilities
- World renowned for research and technology
- Best-of-breed product process development

27 Firms

- Includes firms who have a specialty in finding liquidity for hard-to-trade names or firms who have a niche in electronic trading
- Firms who have a core competency of trading internationally in particular regions are also included

5 Firms

- All newly approved firms doing business with TRS

Broker Certification Process

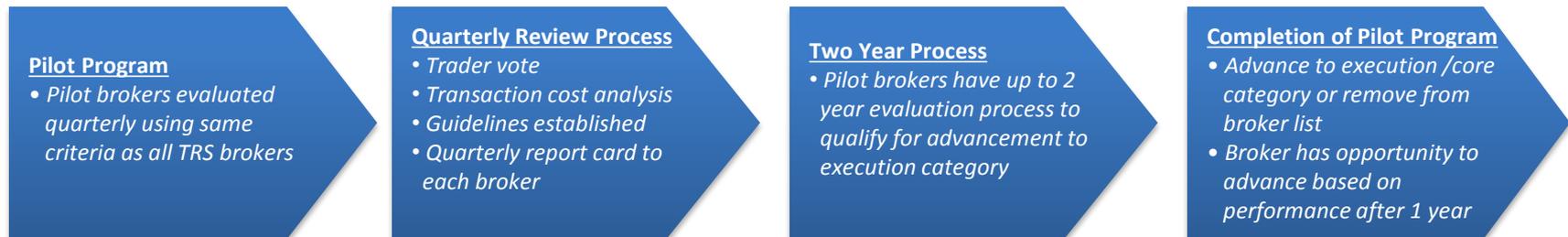
As of December 31, 2015

Phase 1 - Certification Process for New Firms



If acceptable, then ...

Phase 2 - Broker added to Pilot Program



Equity Trading Performance

	1Q15	2Q15	3Q15	4Q15	2015	2014
TRS Performance vs. Post Trade Ace (bps)	-2	7	0	12	4	8
Median Desk Performance vs. Post Trade Ace (bps)	-2	-2	-2	-3	-2	-2
TRS vs. Median Desk (bps)	0	9	2	15	6	10
TRS vs. Median Desk (\$ in millions)	\$0.0	\$7.2	\$1.4	\$8.4	\$15.6	\$25.5
1st Quartile Desk Performance vs. Post Trade Ace (bps)	1	0	2	2	1	3
TRS vs. 1st Quartile Desk (bps)	-1	7	-2	10	3	5
TRS Quartile Placement	2nd	1st	2nd	1st	1st	1st

- The total Equity trading cost for 2015 includes \$37.8 million in market impact (14.4 bps) and \$28.9 million in commissions and fees (11 bps)
- How is trading measured?
 - Consistently outperformed the peer median and has placed in the first quartile in five of the last six years
 - Every order is measured versus the order arrival price and adjusted by ITG's Post Trade Ace benchmark in order to account for current market conditions
 - Trade Management Group's benchmark-adjusted performance is then compared to the benchmark-adjusted performance of its peers



Source: ITG/Plexus is the leading independent transaction cost provider. Their client base entails the largest peer universe compared to their competitors.

Passive Equity Management

Performance as of December 31, 2015

Passive Equities	Market Value (in Millions)	1-Year
USA Equity	\$532.3	0.74
MSCI US IMI		0.64
Alpha		0.10
Non-US Developed	\$698.3	(2.61)
MSCI EAFE + Canada		(3.04)
Alpha		0.43
Emerging Markets	\$1,355.6	(14.55)
MSCI Emerging Markets		(14.92)
Alpha		0.37

Additional \$193.6MM in USA Small Cap invested 7/31/15. As of 12/31/15, USA Small Cap Alpha is 0.07.

Positive alpha gained by strategically trading around quarterly index rebalance events, securities lending, and corporate action monitoring.

Tracking error is higher for Emerging Markets due to TRS being unable to own restricted securities.

Source: State Street Bank

2015 Priorities – Follow Up

Priority	Action Item	2015 Objective(s) Supported
<p>Routing/Venue Analysis with Tabb Group</p> <ul style="list-style-type: none"> • Detail understanding of how our Trading partners interact with different venues/exchanges/dark pools. • Optimize our smart order routing strategies to avoid toxic venues. 	Complete	Circle of Competence, Repeatable Practices
<p>Start Implementation</p> <ul style="list-style-type: none"> • START is an optimized scheduling and trading engine that uses econometric modeling of alpha, order source, market conditions and order specifics to develop tactical trading strategies. 	Complete	Circle of Competence, Repeatable Practices
<p>Cross Currency Margin Analysis</p> <ul style="list-style-type: none"> • Review the daily cross currency margin practices and fee structure of our FCM to identify areas of improvement. 	Complete	Circle of Competence, Repeatable Practices

2015 Priorities – Follow Up

Tabb Clarity

- Objective

- Review algorithm performance to measure efficiency.
- Categorize algos based on strategy (e.g. opportunistic, aggressive, passive etc.).
- Score algorithms with a metric between 1 and 100 based on 6 factors (low is poor, high is superior).

ALGO CLASS: LIQUIDITY SEEKING	Total Efficiency	Fill Size	Opportunity Cost	Sub Optimals	Reversion Continuance	Fill Rate	Price Improvement
ALGO A	62	47	86	87	56	37	53
ALGO B	57	27	78	33	79	51	45
ALGO C	34	50	1	50	50	1	50
ALGO D	30	50	-	1	50	1	50

2016 Priorities

Priority	Action Item	2017 Objective(s) Supported
Deliver upper third trading results over one year rolling periods as measured by an approved independent external transaction evaluation service	Review trading performance by market venue and evaluate broker smart order routing	Repeatable Practices
Effectively oversee a set of global trading relationships that takes full advantage of the Trust's unique size and that fully addresses the Trust's global breadth	Continue monitoring and refinements of premier list and execution trading partners and incorporate FX post trade analysis using ITG.	Repeatable Practices
Ensure that the Trust's trading platform appropriately utilizes all required trading technology	Continue to evaluate new trading platforms and benchmark against current technology	Repeatable Practices
Collaborate effectively and efficiently with all back office functions	Maintain failed trades less than 1% of total trading volume and complete eTools metrics by requested due date	Repeatable Practices
Deliver professional and timely reporting to the appropriate people	Create a futures post trade analysis to evaluate derivatives trading	Strong Pricing Skills
Deliver index returns on passive equity portfolio in allocated areas	Continue to oversee US, EAFE and EM passive portfolios producing returns in line with the benchmarks	Repeatable Practices

APPENDIX

This slide was intentionally left blank.

This slide was intentionally left blank.